as Bulletin no. 12 of the U. S. Dept. of Agriculture, Division of Botany, and contains 50 most excellent plates. The drawings have been chiefly done by Mr. W. R. Scholl, who is surely to be highly commended for his work, and in the descriptions the author has been aided by Mr. F. V. Coville. A second part, containing an equal number of plates, is now in preparation. This is undoubtedly the most important work on American grasses that has been undertaken, and it is to be hoped that not only the grasses of the desert region will be so treated, but all North American grasses.

NOTES AND NEWS.

THE BOTANICAL GARDEN at Prague was ruined by the great flood of last September.

DR. J. W. MOLL has been called to the professorship of botany at the University of Groningen.

PINUS Montezumæ, of Mexico, is described and illustrated in *Gardeners' Chronicle* for Oct. 25.

PROFESSOR CONWAY MACMILLAN, of the University of Minnesota, has been appointed botanist of the Geological and Natural History Survey of that State.

DESCRIPTIONS of 55 new North American fungi are published by Messrs. Ellis & Everhart in the Proc. Phila. Acad. The reprint bears the date July 29, 1890.

BOKORNY finds by observations with his iron sulphate process that water travels at the rate of 1 meter per hour in the collenchyma of Rumex longifolius.

HANSGIRG has listed and classified the plants having irritable filaments and stigmas, together with those having periodically opening flowers.—See Bot. Cent., 43, 409.

A REVISED list of the Ustilagineæ of Scotland, prepared by Professor J. W. H. Trail, is given in the October *Scottish Naturalist*. It includes 38 species, distributed under 11 genera.

PROFESSOR JOHN M. HOLZINGER, formerly of the State Normal School of Minnesota, has been appointed one of the assistants in the botanical division of the Department of Agriculture.

MR. JOHN ROBINSON, of Salem, Mass., has sent a curious apple, found by W. Leonard. It is a combination Baldwin and Russet, the former forming the upper half, the latter the lower.

THE FOLLOWING North American plants have been recently illustrated in *Garden and Forest:* Arbutus Menziesii (Oct. 22), Hypericum densiflorum and H. prolificum (Oct. 29), Solidago speciosa (Nov. 19).

MRS. E. G. BRITTON has prepared an index to the *Bulletin of the Torrey Botanical Club*, volumes vii–xvi. The previous volumes were indexed separately. Such indexes are absolutely essential to working botanists.

MR. F. V. COVILLE, of the Department of Agriculture, has been appointed botanist of the biological survey of "Death's Valley," California, under direction of Dr. C. H. Merriam. He has already started for the field, and expects to be absent about six months.

MR. THEO. HOLM, of the U. S. National Museum, would like to secure, for germination, any seeds of North American perennial plants. Seeds of Burmannia, Mayaca and Xyris are particularly desired.

THE Botanical Society of W. Pennsylvania, situated at Pittsburgh, is a very active organization numbering 91 members. The officers for 1890–91 are Prof. J. W. Caldwell, president; Prof. J. G. Ogden, secretary; and Mr. C. C. Mellor, treasurer.

THE ANNUAL REPORT of the State Botanist of New York, for 1889, has just appeared. Mr. Peck describes, with the aid of four plates, 37 new species of fungi. Among them is a new genus of Helvellaceæ dedicated to Professor L. M. Underwood under the name Underwoodia.

DR. BYRON D. HALSTED writes in *Popular Science Monthly* (December) of "Prairie flowers in late autumn." The material for such a paper was obtained while the author was botanist at the Iowa Agricultural College.

THE EDITOR of the *Scottish Naturalist*, Professor J. W. H. Trail, resigned his position with the October number, and Mr. W. Eagle Clark, an ornithologist of Edinburgh, will hereafter conduct the magazine. Professor Trail has consented, however, to edit the botanical articles.

MR. ERWIN F. SMITH has made good progress in his investigations of peach yellows, and among other important results has demonstrated by numerous experiments that the disease can be conveyed to a healthy tree by budding. The results of his recent studies will be ready for publication in a short time.

IN HIS fifth contribution to the life histories of plants (reprinted from Proc. Philad. Acad. Sci., Aug. 26, 1890), Mr. Thomas Meehan speaks of the following subjects: anthers of Lappa major; pollination of Crucianella stylosa; unisexuality in connection with the order of flowering in willows; varying character of dichogamy in flowers of Corylus Avellana; diœcism in Labiatæ; self-fertilizing flowers; male and hermaphrodite flowers of Æsculus parviflora; direction of the spiral twist in the leaves of the Norway spruce.

M. HENRI JUMELLE has determined the effect of anæsthetics upon the transpiration of plants. He finds that a dose which will arrest or diminish assimilation in an illuminated plant increases the transpiration of the leaves over the normal; whereas in darkness ether diminished the transpiration. He explains that this discrepancy is due to the action of the ether on the chlorophyll bodies themselves. Normally part of the radiant energy absorbed by the chlorophyll bodies is used to decompose CO_2, and part to evaporate water from the chlorophyll bodies. When anæsthetized, however, all the energy is used in producing cholophylline transpiration.—Cf. *Rev. gén. de Bot.* 2, 417.

IT MAY now be considered as a well-established fact that vegetation exerts a definite and easily demonstrable drainage action on the soil. Ebermayer's earlier researches have shown that more water penetrates the soil of shaded regions than into that of naked fields. By some recent researches he shows that while the surface portions of the soil in a forest is moister than open fields, this is not true of the deeper parts within the range of the roots of the trees, for this is distinctly drier. For example: at a depth of 45–50 cm. in a fir forest of 60-year-old trees the percentage of water by weight is 15.12 as against 19.89 in naked soil. He has also determined that in soil covered with young trees (6 years old), the loss of water by transpiration is intermediate between that from soil covered by mosses and that covered by grass.

ROSOLL has carefully determined a large number of microchemical methods for the recognition of glucosides and alkaloids. These will be found summarized in a recent paper printed in the 25th *Jahresbericht des niederöster. Landes Real-Gymnasiums Stockerau*, unfortunately a very inaccessible publication.

ALLUSION was made in this journal (xv, p. 188) to the preliminary paper by Dr. Blass, in which he denied that the function of the sieve-tubes was the transport of proteids. He has now published his experiments *in extenso* (Prings. Jahrb. 21, 253–292.). As, according to Heine, the function of the starch sheath is to provide for the formation of the bast, so B. thinks the true function of the sieve-tubes is to provide nourishment for the construction of the xylem. The fact that the sieve-tubes and vessels appear simultaneously in the youngest parts of plants, as well as the fact that the sieve-tubes show their typical form only in plants with true wood, points to reciprocal relations. Furthermore the structure and contents of the phloem are such as to indicate a provision for storage and radial conduction of proteid materials in the immediate vicinity of the cambium.

WORTMANN has just published an important paper (in the *Bot. Zeit.*, 48, 581, et seqq.) on the recognition, occurrence and significance of diastatic ferments in plants. The present view, that starch is always brought into solution by the agency of diastase, is erroneous, he says. Diastase is either not present at all, or not in sufficient amounts, in the assimilating parts of plants to account for the solution of the starch. On the other hand it is found in small quantities (as large, however, as in assimilating organs) in starch-free seeds, tubers and roots. W. concludes that diastase is a direct derivative of protoplasm, sometimes occurring in small quantities, sometimes in large. His experiments go to show that in many cases protoplasm itself brings about the solution of starch. There is really a very short step between the cases of such direct action, and those in which the protoplasm produces diastase in sufficient quantities to effect solution. When we consider the quantitative and temperature relations of the diastatic enzymes it is evident that they ally themselves more closely with vital than with chemical substances. The observations and conclusions of W. harmonize well with the investigations of Krabbe (see this journal xv, p. 279) on the mode of solution of starch grains by diastase and with Haberlandt's studies on the diastase secreting function of the "aleurone-layer" in the seeds of grasses.